

LOWLAND CALCAREOUS GRASSLAND (UK BAP PRIORITY HABITAT)



Summary

These are unimproved grasslands on base-rich soils in the southern and eastern Scottish lowlands. They consist of mixtures of grasses growing with a rich array of herbs including small base-tolerant herbs.

These grasslands typically occur as small patches among mosaics with acid and neutral grasslands (including agriculturally improved grasslands), scrub and rock outcrops, and are most common on southerly aspects. Their total extent in Scotland was estimated in 2004 to be only 46 hectares. They are of high conservation value in being small patches of very concentrated high diversity within larger landscapes dominated by intensively managed farmland. They are home to some uncommon plant species and are an important food source for grazing mammals, invertebrates and birds. They are produced and maintained by grazing, which is needed to keep larger, more vigorous plants in check and thereby maintain high botanical diversity.

What is it?

Lowland calcareous grasslands are communities of thin, dry, base-rich mineral soils derived from rocks such as limestone, various igneous rocks and some sandstones. They are notable for being generally rich in species, including several small, low-grown herbs. Low shoots or mats of wild thyme *Thymus polytrichus* are invariably present and serve to distinguish the vegetation from neutral and acid grasslands. Some stands also contain similar low mats of common rockrose *Helianthemum nummularium*. The main sward is short and made up mainly of the grasses sheep's fescue *Festuca ovina*, red fescue *F. rubra*, crested hair-grass *Koeleria cristata*, meadow oat-grass *Helictotrichon pratense*, quaking grass *Briza media*, spring sedge *Carex caryophyllea* and glaucous sedge *C. flacca*.

Associated herbs typically include bird's-foot trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata* and purging flax *Linum catharticum*. Mosses are generally sparse, but *Hypnum lacunosum* and *Homalothecium lutescens* can be plentiful.

Compared with upland calcareous grasslands bents *Agrostis* spp., sweet vernal grass *Anthoxanthum odoratum* and tormentil *Potentilla erecta* are scarce but *K. cristata*, *H. pratense* and *B. media* are more common.

These grasslands form patches of very concentrated high diversity within larger landscapes dominated by intensively managed farmland. This applies to their occurrences both in Scotland and the rest of the UK. Although they are not natural (they would be woodland or scrub in the absence of grazing) and are maintained by agriculture, they are clearly semi-natural and show well the effects of the base-rich soils. They are among the most species-rich habitats in the lowlands of Scotland and of the UK as a whole. For example, some rocky areas of this habitat in the Lothians have very rich floras including good populations of uncommon or local species such as spring cinquefoil *Potentilla neumanniana*, *Helianthemum nummularium*, maiden pink *Dianthus deltoides*, wild onion *Allium vineale*, purple milk-vetch *Astragalus danicus*, kidney vetch *Anthyllis vulneraria*, meadow saxifrage *Saxifraga granulata*, sea mouse-ear *Cerastium diffusum*, early forget-me-not *Myosotis ramosissima*, knotted clover *Trifolium striatum*, spring vetch *Vicia lathyroides* and on rocks the mosses *Pterogonium gracile*, *Leucodon sciuroides* and *Grimmia decipiens*, and several crustose lichens. On these sunny lowland slopes the flowering plants are a valuable nectar source for insects.

How do I recognise it?

Differentiation from other Priority Habitats

To a large extent the NVC community separates the Lowland calcareous grassland and Upland calcareous grassland priority habitats in the UK: CG1-8 are lowland communities and CG11-14 and U5c are upland ones. CG9-10 occur in both lowland and upland priority habitats and should be divided according to whether they are above the upper limits of agricultural land (upland) or within enclosed fields (lowland). Examples on coastal cliffs are classed as lowland. Examples of CG9 and CG10 on limestone pavements belong to the Limestone Pavements priority habitat.

Definition in relation to other habitat classifications

Classification	Habitat types belonging to this UK BAP priority habitat
NVC	CG2 and CG7 (all examples which are not on coastal cliffs or sand dunes). CG10 (examples in the lowlands but not on coastal cliffs or on limestone pavements). In England and Wales this priority habitat also includes CG1, CG3-6 and CG8-9, but these communities do not occur in Scotland. (CG2, 7 and 10 are included in the Scottish Biodiversity List.)
Phase 1	B3 (lowland examples).
UK BAP broad habitat	Examples of this priority habitat conforming to NVC CG2, CG7 and CG10 as described belong within the broad habitat - Calcareous grassland.

Most of the Lowland calcareous grassland in Scotland is CG7 and CG10. The only other NVC type among Scottish examples of this priority habitat is CG2, and this is rare in Scotland. Most Scottish examples of CG2 and CG7 lack southern species which are characteristic of these NVC communities in England and Wales i.e. *Sanguisorba minor*, *Scabiosa columbaria*, *Plantago media*, *Leontodon hispidus* and *Carlina vulgaris*. However, they are identifiable as these NVC types by the scarcity of *Agrostis*, *Anthoxanthum* and *Potentilla erecta* and the correspondingly greater amounts of *Koeleria*, *Briza*, *Helictotrichon pratense* and *Carex flacca*.

Definition in relation to legislative classifications

Classification	Habitat types belonging to this UK BAP priority habitat
Habitats Directive Annex I	H6210 (all examples of this Annex I type which are situated within the enclosed agricultural lowlands (this same Annex I type also takes in some of the Upland calcareous grassland priority habitat)).
SNH SSSI habitat features	Lowland calcareous grassland SSSI feature type (all examples).

Where is it?

At most of its Scottish sites, Lowland calcareous grassland occurs in non-intensively managed pasture land, in association with other UK BAP priority habitats, especially Lowland dry acid grassland, Lowland meadows and Inland rock outcrop and scree habitats. These mosaics add further botanical diversity to these sites. A typical pattern is for the Lowland calcareous grassland to occupy steep lower to middle slopes of small hills and knolls, with Lowland dry acid grassland further upslope (especially NVC type U1 on thin soils along the upper parts of slopes) or on more shaded north-facing slopes (where U4 can occur) and in some cases Lowland meadows (NVC MG5) just downslope, where soils become deeper. However, in intensively managed farmland where so many grasslands have been treated with fertilisers it is common for the adjacent deeper soils to support improved grasslands, especially NVC type MG6. Another habitat commonly associated with Lowland calcareous grassland in Scotland is gorse scrub (NVC W23).

These grasslands are scattered thinly but widely through the lowlands of Britain, especially on limestones including chalk, but are scarcer in Scotland than in England and Wales. Within Scotland they are most common and best developed on rocky, south-facing slopes of low volcanic hills in the Scottish Borders, Lothians and Fife. The most common NVC types in these places are CG7 and CG10. CG2, which is the most common lowland calcareous grassland type in England and Wales is very rare in Scotland. Some of the few examples here are on coastal slopes and are therefore in the Maritime cliff and slopes priority habitat. The total extent of this type of vegetation in Scotland is very small and in 2004 it was considered to be just 46 hectares (Ellis and Munro 2004).

There are broadly similar lowland calcareous grassland communities in mainland Europe.

What is special about it?

The importance of these grasslands as some of the most ecologically rich habitats in our lowland landscapes has already been mentioned. Some species of special conservation status recorded in this priority habitat in Scotland are listed below.

Group	Common name	Latin name	UK BAP priority list	EC Habitats Directive Annex II	Scottish Bio-diversity List	Red Data List	Wildlife and Countryside Act (1981)
mammal	brown hare	<i>Lepus europaeus</i>	y		y		
bird	skylark	<i>Alauda arvensis</i>	y		y	y	y
bird	linnet	<i>Carduelis cannabina</i>			y	y	
butterfly	small heath	<i>Coenonympha pamphilus</i>	y		y		
butterfly	northern brown argus	<i>Aricia artaxerxes</i>	y		y		y
moth	white-spotted sable moth	<i>Anania funebris</i>	y		y		
moth	grass rivulet	<i>Perizoma albulata</i>	y		y		
moth	slender scotch burnet	<i>Zygaena loti subsp. scotica</i>	y		y		
fly	phantom hoverfly	<i>Doros profuges</i>	y		y		
bee	wall mason bee	<i>Osmia parietina</i>	y		y		
reptile	slow-worm	<i>Anguis fragilis</i>	y		y		y
reptile	common lizard	<i>Zootoca vivipara</i>	y		y		y
flowering plant	maiden pink	<i>Dianthus deltoides</i>				y	
flowering plant	purple milk-vetch	<i>Astragalus danicus</i>	y		y	y	
flowering plant	hoary cinquefoil	<i>Potentilla argentea</i>			y	y	

How do we manage it?

Almost all examples of Lowland calcareous grassland are produced and maintained by grazing, especially by sheep, cattle and horses. Grazing prevents larger plants from taking over. In the absence of grazing coarse grasses such as false oat-grass *Arrhenatherum elatius*, cock's foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus* and *Festuca rubra* can thicken up and within about a decade form coarse neutral grassland of NVC type MG1, followed by colonisation by shrubs such as gorse, elder and hawthorn (forming scrub of NVC types W21 or W23), and eventually trees such as ash and sycamore (W8 woodland). However, in some ungrazed or minimally grazed places with coarse grassland and scrub, Lowland calcareous grassland survives on very steep rocky slopes where the rockiness keeps the soils thin and the vegetation open so that larger plants do not out-compete small plants such as *Thymus*, *Helianthemum* and *Dianthus*. In general, however, at least moderate levels of grazing are essential for Lowland calcareous grassland to be maintained.

Where gorse is spreading into areas of Lowland calcareous grassland, manual cutting of this species seems to be the best method of control. Burning is quicker but gorse can regenerate quickly after burning.

Good management includes avoidance of the application of artificial fertilizers which tend to encourage the growth of species such as perennial rye-grass *Lolium perenne* and white clover *Trifolium repens* and lead to a reduction in botanical diversity.

Good management also includes avoidance of afforestation (which leads to overshadowing, smothering by leaf litter and eventual loss of the grassland habitat) and quarrying (which causes a more immediate loss of the habitat).

References, links and further reading

Ellis, N.E. and Munro, K. 2004. A preliminary review of the distribution and extent of BAP priority habitats across Scotland. Scottish Natural Heritage Commissioned Report No.044 (ROAME No. F00NA02).

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UK BAP 2008. http://jncc.defra.gov.uk/pdf/UKBAP_BAPHabitats-25-LowlandCalcGrass.pdf

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Common Standards Monitoring guidance: documents (pdf files) available to download from <http://www.jncc.gov.uk/page-2199>

Countryside Survey: <http://www.countrysidesurvey.org.uk>

National Biodiversity Network (NBN) Gateway <https://data.nbn.org.uk/>

Scottish Natural Heritage website: <http://www.nature.scot>

UK BAP information on JNCC website: <http://jncc.defra.gov.uk/default.aspx?page=5155>